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Remarks

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Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks. Claims 1-15, 18 and 20 are pending in the application. Claims 1-15, 18 and 20 are rejected. No claims have been allowed. Claims 1, 7, and 15 are independent. By this amendment, claims 2, 5, and 6 have been canceled without prejudice. Previously, claims 16-17 and claim 19 were canceled without prejudice.

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35 U.S.C. § 101 Rejections

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The Action rejects claims 1, 7, and 15 on the grounds that it "only recites software steps and does not produce a useful tangible and concrete final result." [Action, p. 4, ¶9.2] Applicants respectfully disagree with the Examiner's characterization of the claims and relevant law, and believes that the claims in their previous state satisfied 35 USC § 101.

First §101 rejection.

The Action argues that claim 1 "do[es] not produce the argued result." [Action, p. 2, para. 4.] Applicants respectfully disagree. The claims most certainly do produce a result. The result is a tested program. A tested program is a concrete result. Applicants respectfully request that this rejection be withdrawn.

Second §101 rejection.

The Action argues that, for claims 1, 7, and 15, "the limitation of causing the program to have a 'higher probability' to execute through states that have been untested is deemed to not be concrete." [Action, page 6, para. 12.] The Action further states: "Specifically, the criteria for the higher probability is not set forth clearly enough that the result would be consistently repeatable and reproducible. Having a 'higher probability' does not guarantee that all or any of the untested sections will be reached." [*Id.*] Applicants respectfully disagree. First, the claims do not have language that "guarantee[s] that any or all of the untested sections will be reached." Further, the Action seems to be arguing that because probability is used, the action is not *repeatable and reproducible* because a slightly different path through the program under test will be executed each time.

Applicants respectfully submit that the rule is not that the identical repeatable and reproducible result must be returned each time. MPEP 2106 states that "the process must be substantially *repeatable* or the process *must substantially produce the same result again*." [MPEP 2106(IV)(c)(2)(c), emphasis added.] The phrase "repeatable and reproducible," used by the Action, is not found in the MPEP.

The requirement of "substantial" reproducibility has to do with whether someone can technically build the described methods and systems, not about whether such methods and systems incorporate probability into their makeup. If "substantial reproducibility" meant that identical results were required every time, then patents on games of chance, whose entire point is non-reproducibility, would be disallowed. However, they are not. United States Patent Class 273/139 is "Chance selection;" i.e., the class involves games of chance, which require probability; United States Patent Class 463/16 is "In a game of chance."

Further, the requirement of "substantial" reproducibility is a requirement that the claims are not directed to a frivolous, inoperative machine. *In re Swarz*, cited by the Office to show the need for substantial repeatability, is a case where the Federal Circuit determined that a cold fusion invention failed to comply with U.S.C. §101 because it did not work even once (i.e., was "inoperative") and thus had no utility. *See In re Swa*rz, F.3d 862, 864 (Fed. Cir. 2000).

Nevertheless, even though Applicants respectfully disagree with the Examiner's characterization of the claims and relevant law, and believes that claims 1, 7, and 15 in their previous state satisfied 35 USC § 101, the above-rejected claims have been amended in an effort to expedite prosecution. Claims 1, 7, and 15 now more fully point out, e.g., the processes and systems used to calculate strategies that lead to higher probabilities.

As the requirement for 101 is that the claims define a working process, not that exact repeatability be required, Applicants respectfully request that this rejection be withdrawn.

Third §101 rejection.

The action also states "the claims are drawn to non-statutory subject matter as claiming functional descriptive material *per se*.... '[S]toring a representation of the created strategies in computer memory' is not adequate to resolve the deficiency because the claim steps are drawn to software instructions. The functionally descriptive 'storing' is merely an instruction and is not

embodied on a computer-readable medium." [Action, para. 12, pages 6 and 7.] Applicants respectfully disagree.

The MPEP explicitly allows for computerized process claims. "The claim remains statutory irrespective of the fact that a computer program is included in the claim. The same result occurs [i.e., the claim remains statutory] when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material *per se* and hence nonstatutory." MPEP 2106.01(I).

Applicants respectfully disagree with the Examiner's characterization of the claims and relevant law, and believe that claim 1 in its previous state satisfied 35 USC § 101. Nevertheless, Applicants have amended claim 1 in an effort to expedite prosecution. Specifically, the language "*in the computer*" has been added to the language "executing the program under test using the stored created strategies …" Thus, the computer is executing the instructions set forth in the program under test.

As claims are statutory under U.S.C. § 101 "where the computer executes the instructions set forth in the computer program" as is done in claim 1, Applicants respectfully request that this rejection be withdrawn.

Statutory class of claim 1

The Examiner also states that "the statutory class of claim 1 is unknown and cannot be determined from the claim language."

Applicants respectfully submit that claim 1 is a computerized process claim. Computerized process claims are explicitly allowed, as shown by the following passage in the MPEP. "The same result occurs [i.e., the claim remains statutory] when a computer program is used in a computerized process where the computer executes the instructions set fort in the computer program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material *per se* and hence nonstatutory." MPEP 2106.01(I).

Claim 1 taken as a whole is not directed to a mere program listing, i.e., to only its description or expression. For example, the claim requires the computerized processes

"receiving... executing... storing .... executing..." As U.S.C. § 101 allows computerized
process claims, and as claim 1 is best characterized as a computerized process claim, Applicants
respectfully request that this rejection be withdrawn.

§ 101 conclusion.

Thus, at least for these reasons, Applicants respectfully submit that claims 1, 7, and 15
are directed to statutory subject matter and request that the rejections under 35 U.S.C. § 101 be
withdrawn. Claims 3-4, 8-14, 18 and 20 depend, ultimately, on Claim 1, 7, or 15 and at least for
that reason should also not be subject to a 35 U.S.C. § 101 rejection.

35 U.S.C. § 112 Rejections

The action rejects claims 1-15, 18, and 20 under 35 U.S.C. § 112, first paragraph as
failing to comply with the enablement requirement. The Action, in the rejection, states
"Regarding claim 1, 7, and 15, the deficient limitation is 'creating strategies through the graph
that have a higher probability of reaching discrete sequences not reached by the program' /
'determining strategies for the sequences of at least two edge transitions ending at non-
deterministic behavior more likely to reach an identified program behavior.'"

Applicants respectfully submit that the specification and figures as filed discloses
methods for creating and determining strategies with sufficient enabling detail. The MPEP states
the rule on enablement as follows: "As long as the specification discloses at least one method
for making and using the claimed invention that bears a reasonable correlation to the entire scope
of the claim, then the enablement requirement of 35 U.S.C. 112 is satisfied." [MPEP,
2164.01(b).] The specification thoroughly describes creating strategies/determining strategies,
e.g., on page 13 line 17 through page 26, line 7, and in figures 4-13.

An overview of creating/determining strategies is given at page 9. lines 11-28,
reproduced below:

> At 312, the method creates strategies through the graph that have a higher
> probability of touching untouched vertices or edges. For example, the method
> traverses the graph backwards starting from untouched vertices, and computes
> costs and probabilities at each vertex with an edge that reaches the untouched
> vertex. For non-deterministic vertices with edges reaching an untouched vertex, a
> probability is assigned based on the likelihood that the edge exiting the non-
> deterministic vertex will be selected. The method continues by stepping

backward through the graph and assigning probabilities and costs to vertices
based on the probability that they will be able to provide a path to an untouched
vertex. Vertices that provide a higher probability of reaching an untouched vertex
are selected as strategies.

At 314, the method then executes the program again, this time providing
an execution path to the program through a set of states more likely to reach an
untouched vertex. Since the program contains non-deterministic behavior (e.g.,
states), probability strategies only place non-deterministic entities (e.g., remote
programs or behavior) in a position to select an untouched state. However, an
untouched state is not guaranteed. In one example, by presenting a non-
deterministic choice multiple times, it increases the possibility that a desired
reaction will exercise a desired vertex in the program under test.

As can be seen, at least one method is disclosed for making and using the
creating/determining strategies; thus satisfying enablement.

The Action also asks "Also, since the strategy merely has a 'high probability' of reaching
untested points it does not guarantee success and therefore would not be able to know whether
the strategy indeed created a higher probability of success, or not." [Action, page 8, para. 14.]
Applicants disagree. In an exemplary embodiment, probabilities and costs are assigned to
vertices based on the probability that they will be able to provide a path to an untouched vertex
(an untested point). Vertices that provide a higher probability of reaching an untouched vertex
are selected as strategies. Further, it can be tested whether or not the strategy created a higher
probability of success, as testing the program prior to implementation of the strategies and after
implementation of the strategies will do so. In real life, for example, casinos know very well the
amount they will win or lose on average for each of their games of chance, even those games are
probabilistic.

However, to save time and expense, and to make the claims even more fully comply with
the enablement requirement, Claims 1, 17, and 15 have been amended such that creating
strategies that have a *higher probability* is more fully explained.

Accordingly, favorable reconsideration and withdrawal of the rejection of independent
claims 1, 7, and 15 under the second paragraph of 35 U.S.C. §112 are respectfully requested.

35 U.S.C. § 103 Rejections

The Office action rejects claims 1-15, 18 and 20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,659,555 to Lee (Lee) and further in view of Kranzlmuller's "NOPE: A nondeterministic Program Evaluator" (Kranzlmuller).

Claim 1.

Neither Lee nor Kranzlmuller teaches or suggests, e.g., the amended claim 1 language:

> calculating, for at least some deterministic states, a probability that during program execution, a path from the deterministic state will reach the at least one untested state;
> calculating, for the at least some deterministic states, a number of edges between the at least one deterministic state and the untested state as the cost; creating strategies through the graph to reach the untested state such that a next state with a lower cost and higher probability is preferred over a next state with higher cost and lower probability…

To applicant's understanding, neither Lee nor Kranzlmuller teach or suggest calculating probability that a path from a state will reach another state. Thus, the references also fail to teach the additional features required in claim 1 "calculating, for at least some deterministic states, a probability that during program execution, a path from the deterministic state will reach the at least one untested state."

As a separate reason for patentability, to applicants' understanding, neither Lee nor Kranzlmuller teach or suggest calculating the number of edges between two states. Thus, the references also fail to teach the additional features required in claim 1 of "calculating, for the at least some deterministic states, a number of edges between the at least one deterministic state and the untested state as the cost."

Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 1 under 35 U.S.C. §103 is respectfully requested.

Claims 3-4.

Claims 3-4 ultimately depend on claim 1. Thus, at least for the reasons set forth above with respect to claim 1, claims 3-4 should also be in condition for allowance. These claims also set forth independently patentable combinations of method acts.

Claim 7.

Neither Lee nor Kranzlmuller teaches or suggests, e.g., the amended claim 7 language "a calculating program operational to assign probabilities to deterministic states based on the probability that they will provide a path to an untouched discrete sequence, and using the assigned probabilities to calculate a strategy more likely to reach the untouched discrete sequences."

To applicant's understanding, neither Lee nor Kranzlmuller teach or suggest calculating probability that a path from a state will reach another state. Thus, the references also fail to teach the additional features required in claim 7 "a calculating program operational to assign probabilities to deterministic states based on the probability that they will provide a path to an untouched discrete sequence."

As a separate reason for patentability, to applicants' understanding, as neither Lee nor Kranzlmuller teach or suggest calculating probabilities, they also fail to teach or suggest using the calculated probabilities. Thus, the references also fail to teach the additional features required in claim 7 of "using the assigned probabilities to calculate a strategy more likely to reach the untouched discrete sequences."

Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 7 under 35 U.S.C. §103 is respectfully requested.

Claims 8-14.

Claims 8-14 ultimately depend on claim 7. Thus, at least for the reasons set forth above with respect to claim 7, claims 8-14 should also be in condition for allowance. These claims also set forth independently patentable combinations of method acts.

Claim 15.

Neither Lee nor Kranzlmuller teaches or suggests, e.g., the amended claim 15 language "wherein determined strategies are determined based on a determining probability of edges exiting a deterministic state reaching a state representing the identified program behavior, and selection of an edge having highest probability from among the probabilities determined of reaching the state representing the identified program behavior."

To applicant's understanding, neither Lee nor Kranzlmuller teach or suggest calculating probability that a path from a given state will reach another state. Thus, the references also fail to teach the additional features required in claim 15 "wherein determined strategies are determined based on a determining probability of edges exiting a deterministic state reaching a state representing the identified program behavior."

As a separate reason for patentability, to applicants' understanding, as neither Lee nor Kranzlmuller teach or suggest calculating probabilities, they also fail to teach or suggest using the probabilities. Thus, the references also fail to teach the additional features required in claim 15 of "selection of an edge having highest probability from among the probabilities determined of reaching the state representing the identified program behavior."

Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 15 under 35 U.S.C. §103 is respectfully requested.

Claims 18 and 20.

Claims 18 and 20 ultimately depend on claim 15. Thus, at least for the reasons set forth above with respect to claim 15, claims 18 and 20 should also be in condition for allowance. These claims also set forth independently patentable combinations of method acts.

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New Claims and Amendments.

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Support for the new claims and amendments can be found in the application as originally filed. In addition, support can be found at, e.g., page 4, line 25 to page 5, line 18; page 13, line 17 to page 15, line 8; page 24, lines 1-4.

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Request for Interview

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If any issues remain, the Examiner is formally requested to contact the undersigned attorney prior to issuance of the next Office action in order to arrange a telephonic interview. It is believed that a brief discussion of the merits of the present application may expedite prosecution. Applicants submit the foregoing formal Amendment so that the Examiner may fully evaluate Applicants' position, thereby enabling the interview to be more focused.

This request is being submitted under MPEP § 713.01, which indicates that an interview may be arranged in advance by a written request.

Conclusion

The claims should be allowable. Such action is respectfully requested.

Respectfully submitted,

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